Worldview Fires/Thermal Anomalies Exercise

Introduction

Worldview shows the Earth as it looks now, or at least in the last few hours. The imagery is usually available within three hours of observation and can easily be compared with past imagery using a time slider. You can also download data from the website. You can view and download many types of data, including: brightness temperature, fires and thermal anomalies, and land surface temperature from the MODIS sensor.

The Worldview application was demonstrated earlier in this training, and this additional exercise will demonstrate how you can obtain active fire location data (as thermal anomalies) from MODIS.

You can view data on Worldview without a user account. However, if you would like to download data you must create an Earthdata account. This is not required for this exercise, but may be useful for you in the future.

If you would like, you can sign up for an account here: https://urs.earthdata.nasa.gov/users/new

If you already have an account, you can login here: http://urs.earthdata.nasa.gov/

Objectives

- Become familiar with the Worldview website
- Visualize and explore active fire data from MODIS
- Identify a large wildfire using the MODIS Fires and Thermal Anomalies Products
- Understand how to download MODIS Fires and Thermal Anomalies Products from Worldview
- Obtain the tools and tips necessary to visualize and download Worldview data to meet future workplace needs

View and Download Active Fire Data

Visit the Worldview website here: https://earthdata.nasa.gov/labs/worldview/

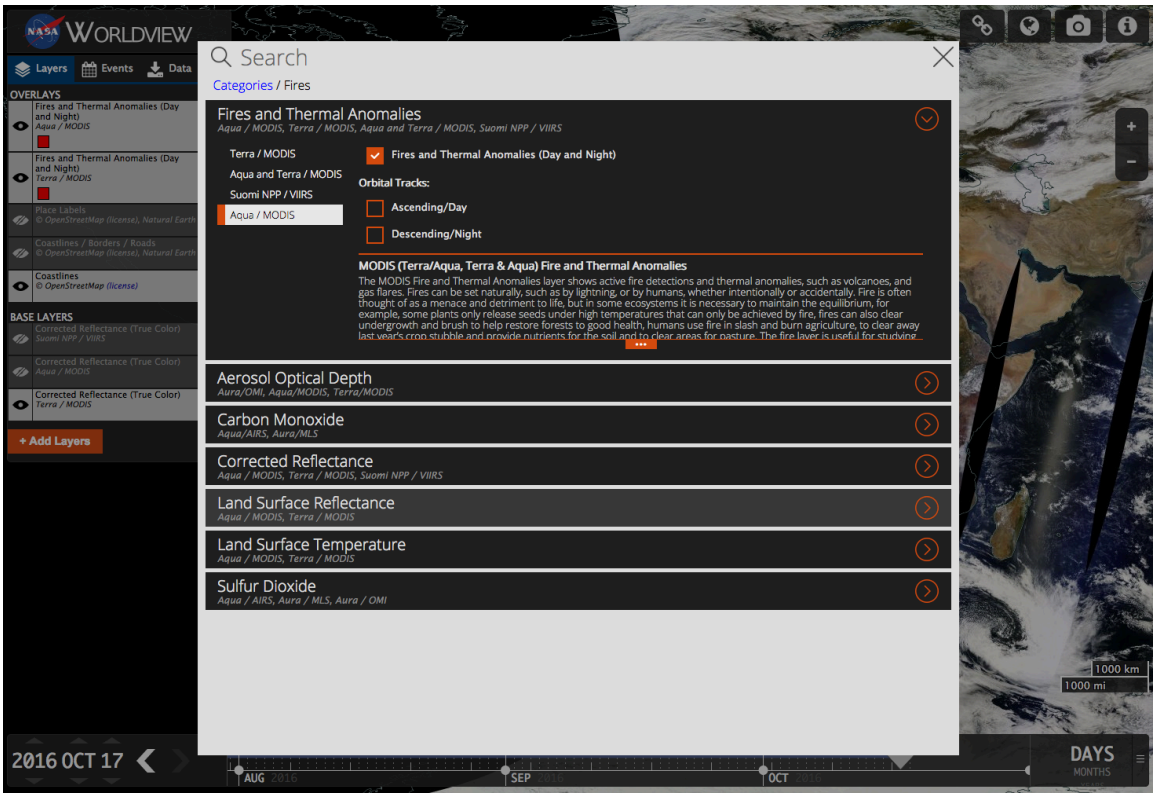
If this is your first visit to the Worldview page, or if you did not check the **Do not Show Again** option, it will ask you to take a tour. This is very quick and provides

you with some useful information. While this is not necessary for this exercise, it is encouraged.

In Worldview you can browse data types based on **Hazards and Disasters** or **Science Disciplines**.

- Click on the **Add Layers** button on the left side of the main page

- You will be taken to the **Hazards and Disasters** search option, and you will notice a **Fires** section on the right side
- Click on **Fires and Thermal Anomalies**
- You will notice four data options for thermal anomalies:
    - Terra/MODIS
    - Aqua and Terra MODIS
    - Suomi NPP/VIIRS
    - Aqua/MODIS
- Click on each product and expand the text information by clicking on the dots below the paragraphs. You will notice the MODIS products have the same information, and the difference between Terra and Aqua depends on the time of the overpass. For the United States, the Terra overpass time is between 10am and 12pm Eastern and the Aqua overpass time is between 1pm and 3pm Eastern.
- Select the **Terra/MODIS** option and click on the red box next to the **Fires and Thermal Anomalies (Day and Night)**
    - You should notice that the **Fires and Thermal Anomalies** overlay is added to the viewer on the left
- Select the **Aqua/MODIS** option and click on the red box next to the **Fires and Thermal Anomalies (Day and Night)**
    - You should notice that the **Fires and Thermal Anomalies** overlay is added to the viewer on the left

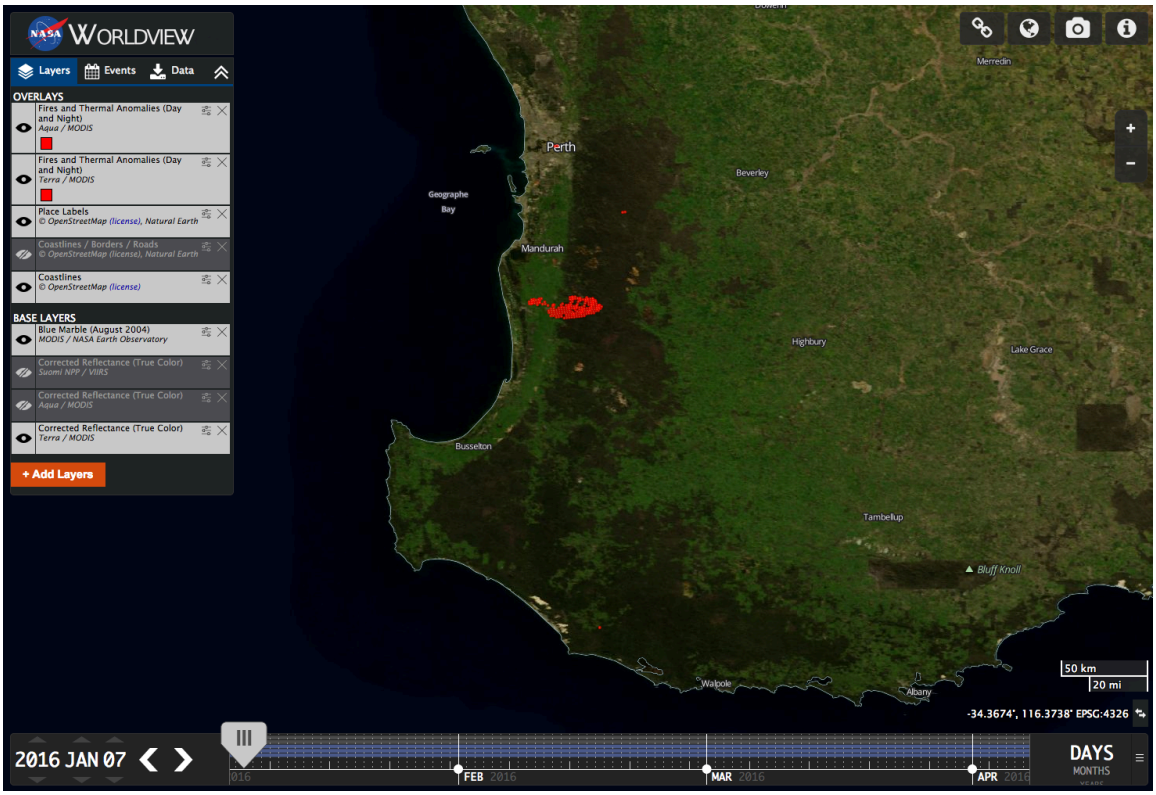


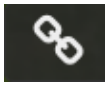
- Click on **Categories** in blue on the top left
  - We will change the background image to the Blue Marble in order to more easily view the fires
- Under **All** on the top left, click on **Blue Marble**. Select the **Blue Marble (August 2004)** option.
  - You should see this layer added to the **Base Layers** on the left
- Exit the Search panel by clicking on the X on the top right

Now you will see the fire locations globally with the Blue Marble base layer. We are going to search for a large bushfire that occurred in Australia in January 2016.

- Use the **Time Slider** at the bottom of the mapper to select January 7, 2016
  - You can change the date by clicking on the arrows on the bottom left, by moving the large grey pointer, or by using the arrows on the top and bottom of the year, month, and day
- Zoom into southwestern Australia
  - You can do this using the "+" sign on the upper right side of the mapper or by using your mouse to zoom

- Turn on the **Place Labels** Overlay. This should be preloaded in Worldview when you visit the site, but it is not initially visible. You can turn on and off layers by clicking on the eye icon next to the layer name.
  -  (Layer off)  (Layer on)
- Zoom in further to the region just south of Perth. You should see a large collection of red dots (fire detects).

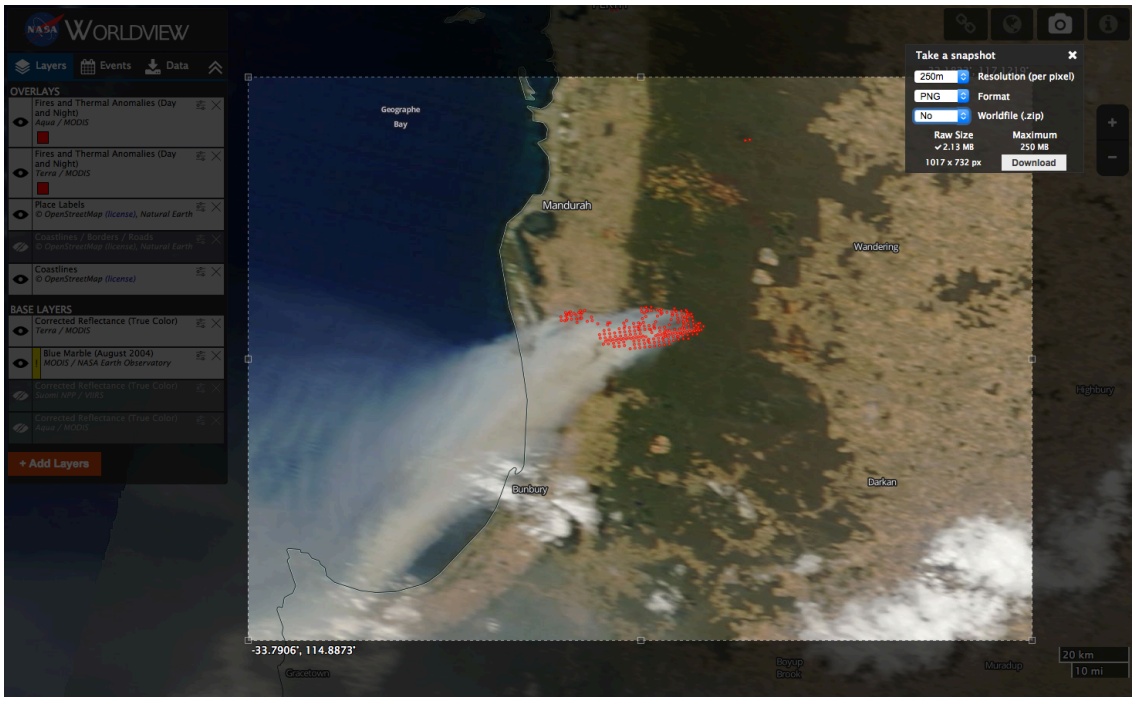


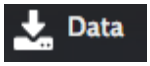
- Click on the chain link icon on the top right of the mapper 
  - This gives you a webpage link (that you can also shorten) to send to colleagues or yourself for later
  - Click on the X on the top right of that small black box to close the link

Since we are viewing the fire locations with the Blue Marble base layer, we cannot see clouds or the smoke plume associated with this fire. However the Corrected Reflectance (True Color) image that is automatically loaded when you visit the Worldview website should show this.

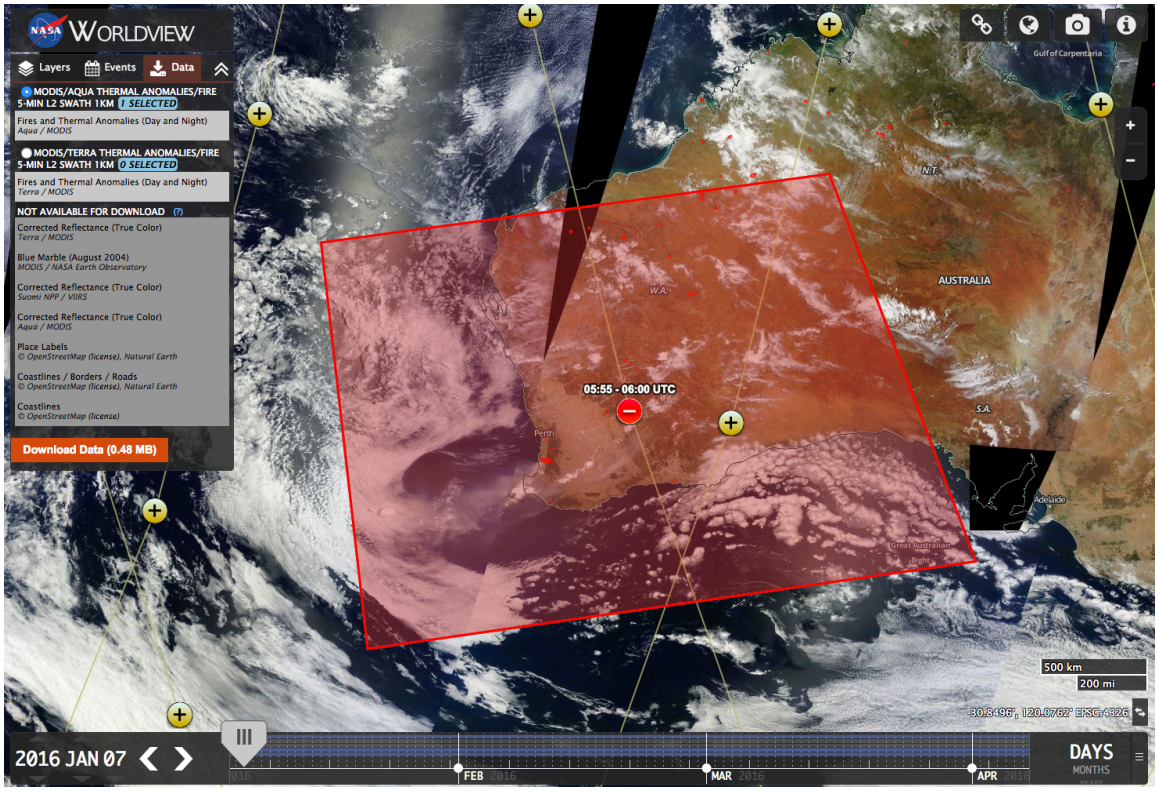
You can adjust the view of the base layers by clicking and dragging on a layer to move one on top of another.

- Click on the **Corrected Reflectance (True Color)** ***Terra MODIS*** layer and move it to the top of the **Base Layers** list
    - You should now see a smoke plume associated with this fire
- Click on the camera icon on the top right of the mapper 
    - Move the image extent around to the area you desire
    - Keep the **250 meter** resolution option
    - Select **PNG**
    - Keep the **No** option selected for the Worldfile (.zip)
    - Click on **Download** on the top right of the mapper. A new tab with the image will appear.
    - This creates a quick snapshot of the image you are viewing. You could also download the image as a KMZ file and open it up in Google Earth. This would be displayed as an image overlay for that region that includes the fire detections and the smoke plume.



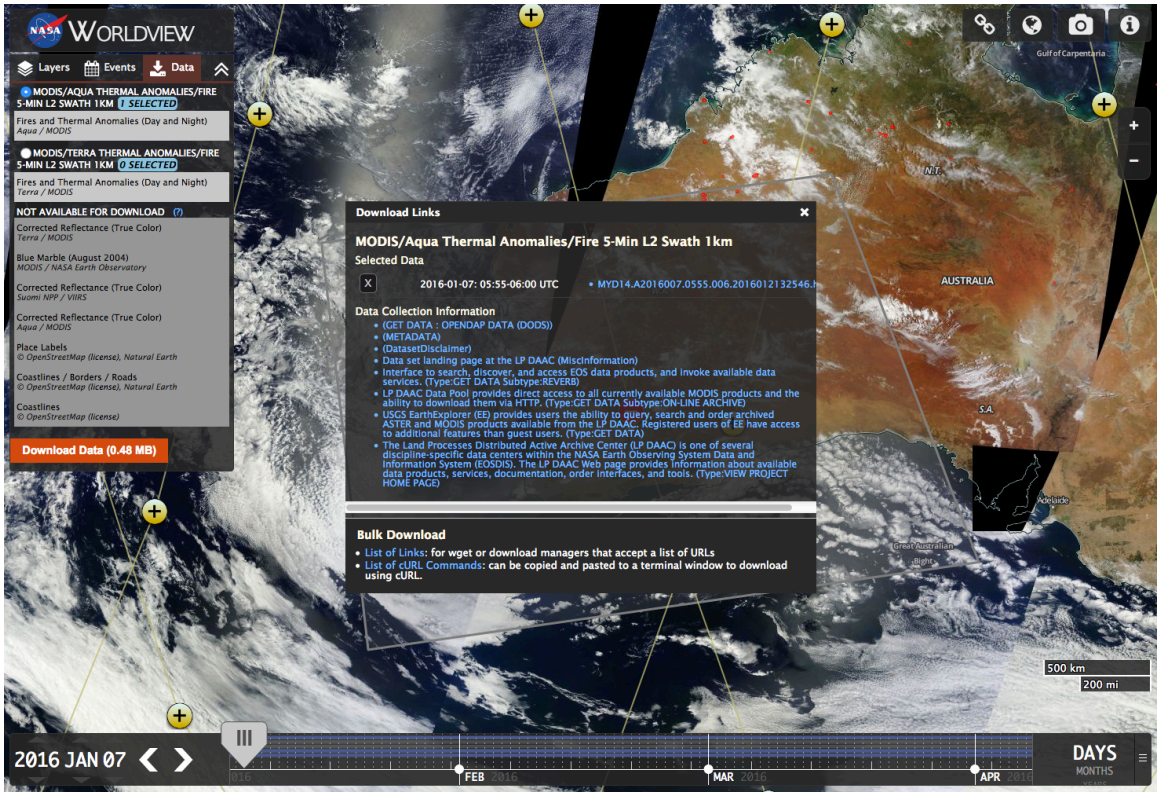
- Go back to your Worldview tab
- Click the ‘x’ to close the **Take a snapshot** window
- Click on the **Data Download** option in the Worldview panel on the left 

- Worldview might ask you to zoom out to view the data that are available for download
    - If you zoom out enough you will see yellow plus marks and lines that outline the extent of the MODIS imagery
- Click on the yellow **+** closest to the fire. You should then see a red outline of the extent of the image available



- Click on the **Download Data** button on the left panel

    - Another window should pop up that provides you with download links to access the data. If you click on the image name (MYD14.A2016007.0555.006.2016012132546.hdf) you will be asked to login to your Earthdata account if you have not done this previously.
    - As mentioned in the introduction, an Earthdata account is required to download the data, but it not necessary for this exercise. However, you now know the steps to download an image from Worldview.



The MODIS Thermal Anomalies data will be downloaded as an hdf file. You can then import these data directly into geospatial software for analysis. You can also use the Bulk Download tools if you are interested in downloading multiple images.

This concludes the Worldview Fires/Thermal Anomalies Exercise. Do you know what western Australia fire we were viewing?

This was the Waroona fire that burned 170,000 acres and destroyed 139 structures. More information about this incident can be found here: http://wildfiretoday.com/tag/waroona-fire/. There is also an image of the fire burn scar from the NASA Earth Observatory here: http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=87351